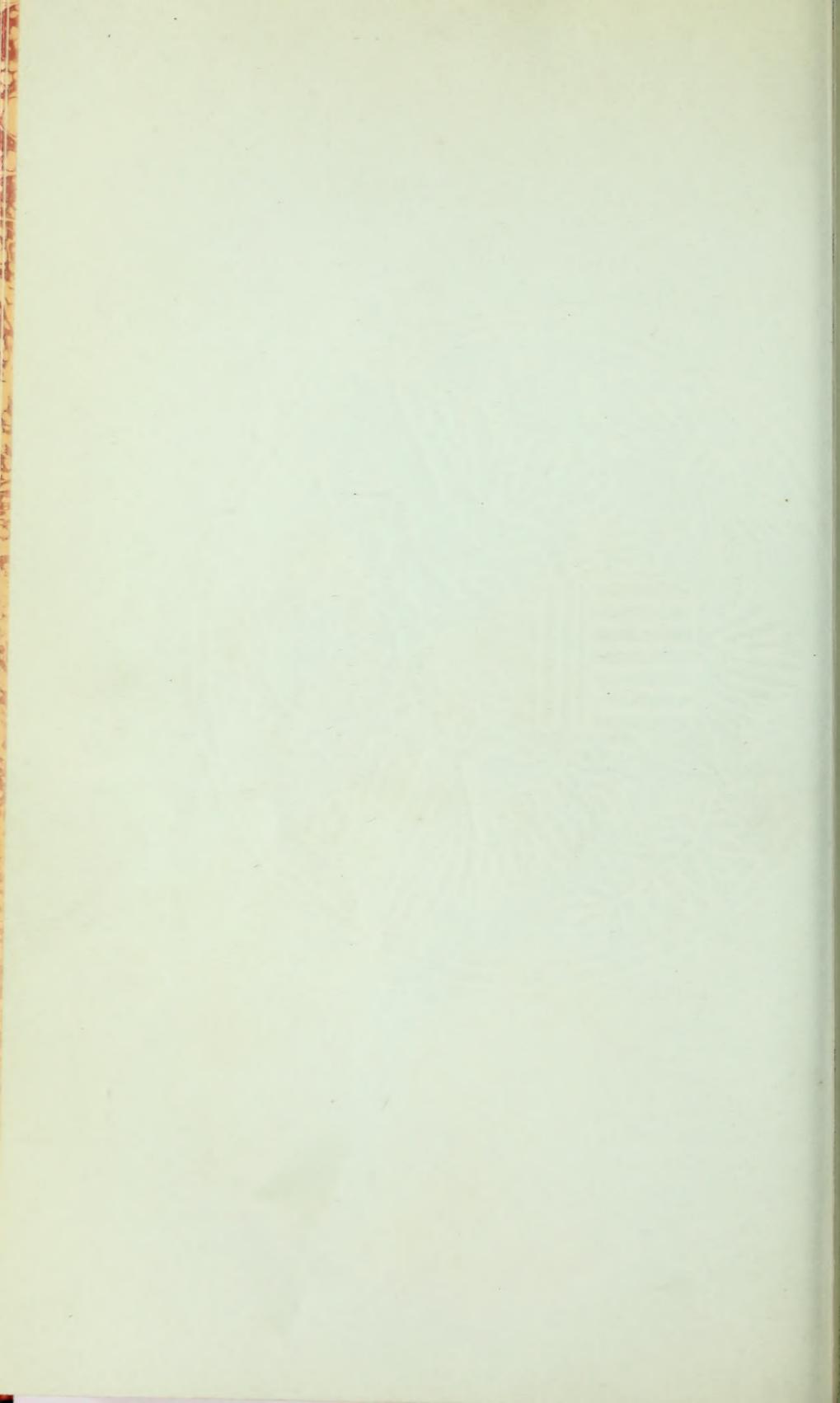


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# BULLETIN OF THE U.S. DEPARTMENT OF AGRICULTURE



No. 84

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Contribution from the Bureau of Plant Industry, Wm. A. Taylor, Chief.  
April 16, 1914.

## EXPERIMENTS WITH UDO, THE NEW JAPANESE VEGETABLE.

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### INTRODUCTION.

A decade has passed since the udo of Japan was first proposed as a vegetable to be grown by Americans. This is a short time for the introduction of a new vegetable, when one considers that it means simply that at ten different times experimenters have had a chance to taste its blanched shoots. But it is appropriate now that there be put in print some account of the experiences which various experimenters have had with this new vegetable.

Enough data are at hand for the production of an extensive bulletin on the udo, but, as much yet remains to be done, the important conclusions regarding its culture can be stated in a few paragraphs for the guidance of those who are interested in trying this new vegetable.

The writer first published, in 1902, a short account of the udo which he wrote in Japan while traveling as Mr. Barbour Lathrop's explorer<sup>1</sup> and before he had had any opportunity to experiment with the plant in America. Necessarily that account lacks any background of personal experience with the difficulties of cultivation.

Since 1906 the writer has had growing on his own place in Maryland just such a patch of udo as he is encouraging others to plant. (Figs. 1 and 2.) Each spring he has had the pleasure of experimenting with it in his kitchen, as well as of blanching it in the garden, and he can speak now regarding it with a degree of confidence not possessed heretofore. As a commercial proposition he has had only the chance of watching an experiment in California made by a large asparagus grower on the Sacramento River, who has now for three years been growing several acres of udo and has shipped crates of it to the eastern market, where, as was to be expected, he has found commission merchants slow to take it up. (Figs. 3 and 4.)

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<sup>1</sup> U. S. Department of Agriculture, Bureau of Plant Industry, Bulletin 42, 1903, pp. 17-20.

NOTE.—Results of experiments in Maryland. Gives methods of cultivation, preparing, and cooking. Adapted to New England, the Atlantic States as far south as the Carolinas, the rainy region of Puget Sound, and the truck sections of California about Sacramento.

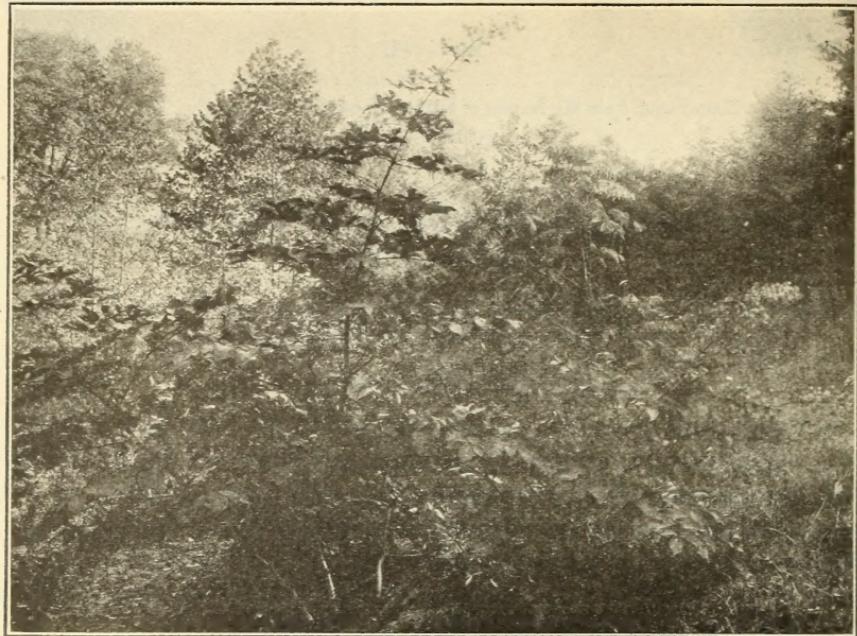


FIG. 1.—Plant of udo at "In the Woods," Chevy Chase, Md., Oct. 12, 1909, from seed planted in the spring of 1906, showing the ornamental character of the growth.

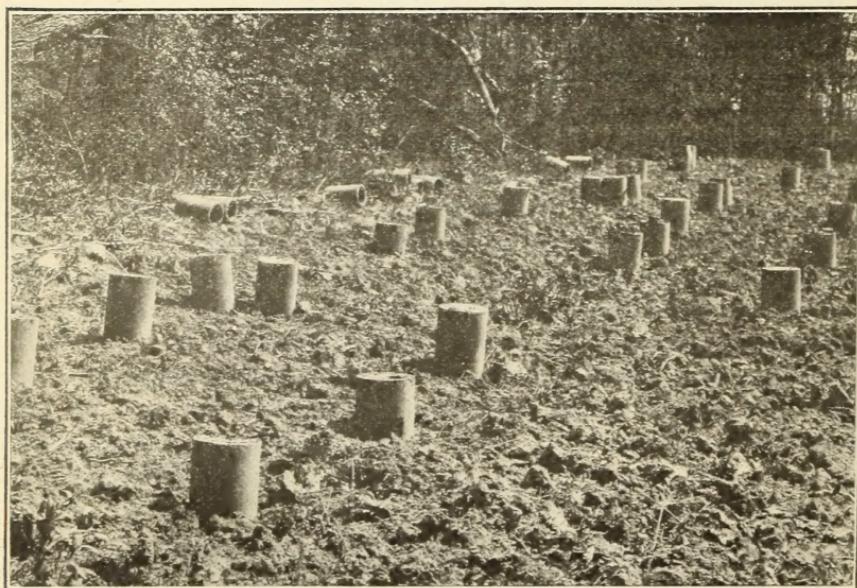


FIG. 2.—Field of udo at Chevy Chase, Md., showing drain tiles used to blanch the shoots in the spring.

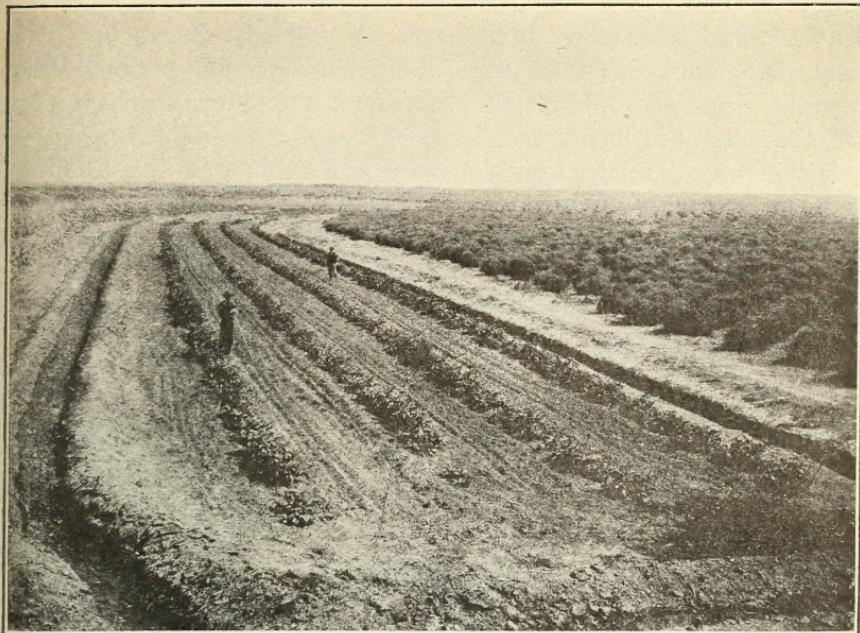


FIG. 3.—The first field of commercial udo in the United States, on the asparagus farm of Mr. M. E. Meek, Antioch, Cal.

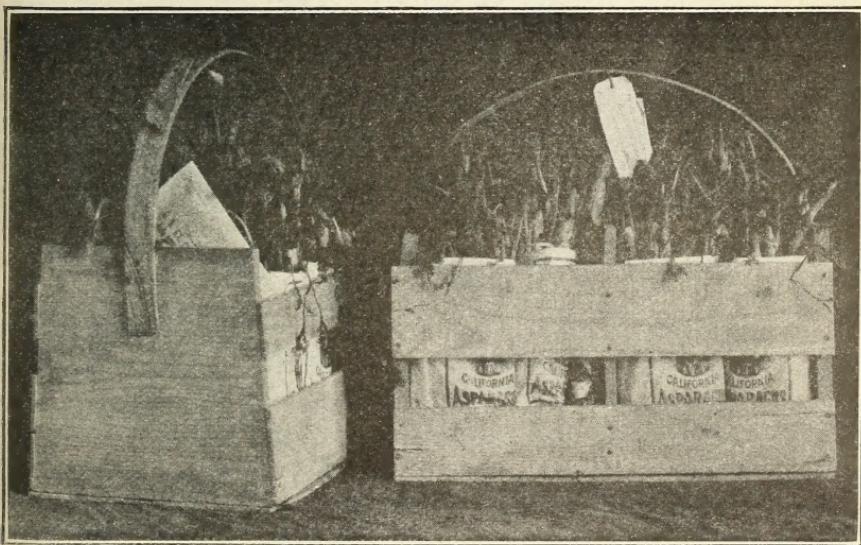


FIG. 4.—A crate of udo as it appeared after being shipped from Antioch, Cal., to Washington, D. C. The shoots were blanched by mounding up the soil, and many of the tips were green from exposure to sunlight above the mounds. Though slightly discolored, these were of good quality when prepared for the table.

There is no doubt that the udo is worthy of adding to our list of spring vegetables, for it is easily grown, its shoots are readily blanched, and it requires little care. A patch of it can be forced every spring for at least six years, and probably much longer. When properly prepared its blanched shoots are delicious; they have their own characteristic flavor, can be prepared for the table in a great variety of ways, and are keenly appreciated by people of discriminating taste. Space for space, udo will yield about the same amount of food for the table as asparagus and will be ready for use at about the same time in the spring. Possibly more labor is required to blanch the shoots of the udo than those of asparagus, but the udo is probably somewhat easier to take care of and yields sooner.

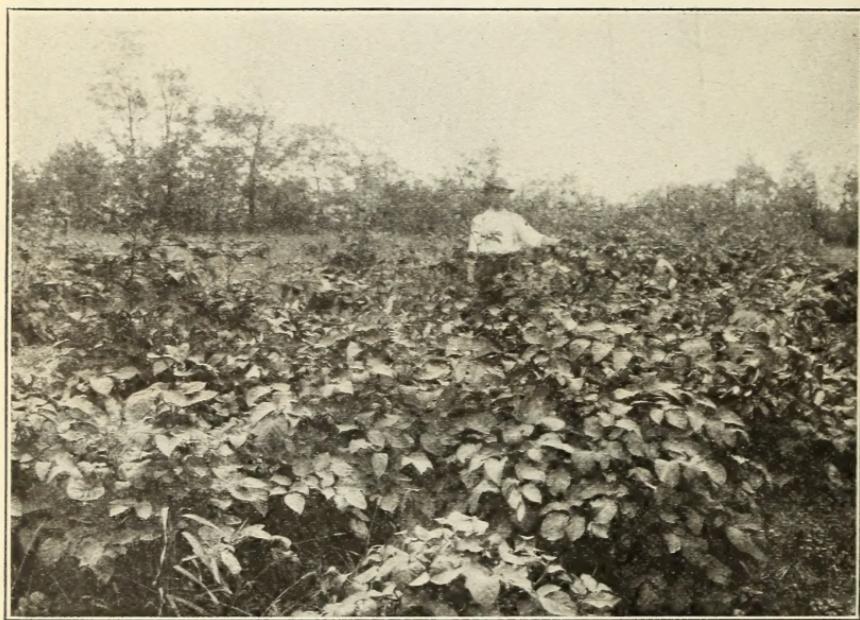


FIG. 5.—Plantation of udo one season from seed at the Arlington (Va.) Field Station, 1905.

As an ornamental, udo has been known to nurserymen for twenty years or more under the name of *Aralia cordata* Thunb. It might be termed a rank-growing, shrubby perennial with a large, fleshy rootstock (fig. 5). It dies down each fall after the first frost and comes up again, much as asparagus and rhubarb do. It grows to a height of 10 feet or more if on rich soil, producing a very ornamental mass of large green leaves, and, in the late summer, long, loose flower clusters, sometimes 3 feet in length. The flowers attract bees and flies in great numbers, and as a honey plant the udo would appear to warrant the attention of beekeepers (fig. 6). A field of udo is generally humming with insects.

## EARLY EXPERIMENTS WITH UDO.

Siebold and Zuccarini,<sup>1</sup> in their Flora of Japan, called special attention as long ago as 1835 to the good qualities of the udo as a vegetable and recommended it for introduction into Europe, with

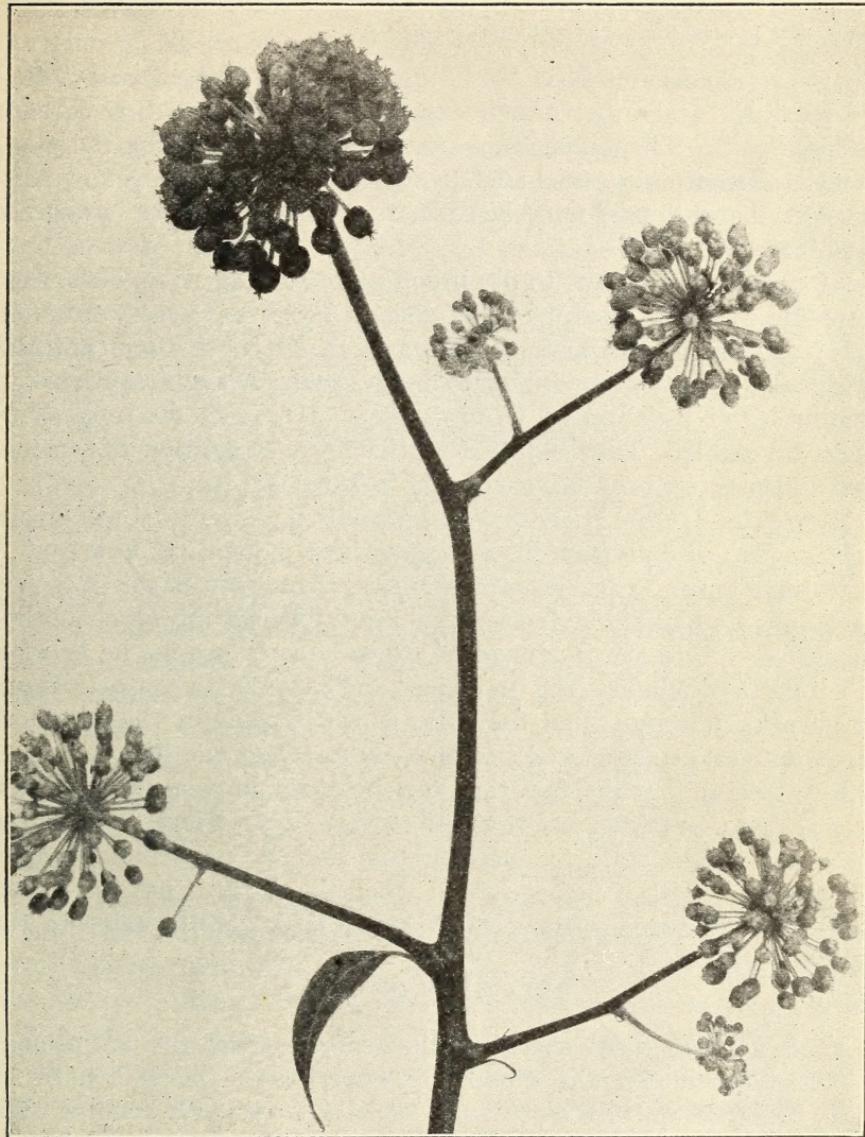


FIG. 6.—Flowers and fruit of the udo. The flowers are visited throughout the season by honeybees and flies, and the dark fruit clusters are ornamental.

the remark that "the young shoots form a delicious vegetable," as follows:

This plant probably came from China, where it is employed as a sudorific; it is cultivated throughout Japan in the gardens and as a field culture.

<sup>1</sup> Siebold and Zuccarini. *Flora Japonica*, vol. 1, p. 57, 1835.

It is cultivated essentially for its root, which has an agreeable flavor, aromatic and bitter, and is eaten in winter prepared as we do the scorzonera (*S. hispanica* L.). The young shoots form a delicious vegetable.

As the plant grows well all over Japan, it will acclimate itself quite as well to our gardens; and this is why, cultivated with us, it may increase the number of our fresh vegetables by the addition of one which is good, wholesome, and nourishing. (Free translation.)

In that remarkable book by Paillieux and Bois, *Le Potager d'un Curieux*,<sup>1</sup> the authors give their experience with udo at their gardens near Crosnes. They experienced such difficulty in raising the plant from seed that they concluded, quite erroneously, as we have discovered, that udo seed must be sown as soon as mature or it will not germinate.

After several attempts to get living plants, dating from 1879, they were finally able to secure 10 of them. These grew very satisfactorily in their garden and, according to their report, they obtained, by blanching, very appetizing-looking shoots, resembling those of medium-sized asparagus. Unfortunately, the taste did not strike them favorably. They objected to the faint suggestion of turpentine and predicted the failure of udo in Europe.

How extensive the trials of Paillieux and Bois were the writer has not ascertained, but from his own experience he realizes how easy it is to form an unfavorable impression regarding the flavor of a new vegetable, and, judging from seven years of trial, in which he has submitted udo to the judgment of a great many people, he believes it is fair to conclude, since no recipes and only the barest details are given in their report, that the culinary trials made by these authors were quite inadequate to do justice to its excellent qualities.

Notwithstanding the fact that raw potatoes, improperly blanched celery, raw asparagus, and raw beets are all most disagreeable to the taste, the tendency is to overlook this and to condemn raw udo, comparing it with blanched celery, when in reality it has too strong a flavor to be eaten without first preparing it for the table in the proper way.

#### RELATIVES OF UDO.

There are two native species of the genus to which the udo belongs which resemble it quite closely in appearance—the spikenard or petty morel of our rich woodlands (*Aralia racemosa* L.) and a California species (*Aralia californica* S. Wats.). The spikenard is said to grow in the shade to a height of 4 or 5 feet, but a plant which the writer has had in his experimental garden in full sunlight for four years has never grown more than 3 feet high. This plant flowers much earlier than *Aralia cordata*, about the middle of July

<sup>1</sup> Paris, 1899, 3d ed.

instead of in September, and is altogether a much smaller plant. The root is said to be pleasant to the taste and was used as an ingredient of homemade beers in colonial times. The writer has never had an opportunity to blanch the shoots of the plant and test them. The California species is considerably larger than the spikenard and has leaves which are of a thicker, more leathery character than either the udo or the spikenard. In Maryland a plant of this species has lived through the mild winter of 1912-13, but it gives the impression of being distinctly not hardy there. It has not yet flowered and is not large enough to furnish shoots for comparison with the Japanese species. As material for breeding, these American forms, and possibly the wild sarsaparilla (*A. nudicaulis* L.), are promising, and there is room here for an interesting piece of breeding work, since it is the vegetative portion of the plant which is used and asexual methods of propagation are a success. No crossing of these species seems to have been attempted.

#### VARIETIES OF UDO.

When first introduced into America as a garden vegetable there were supposed to be two varieties only, the Kan udo and the Moyashi udo. Although grown side by side, there never appeared to be any marked difference between these two kinds, and the writer is convinced that they are identical varieties, Kan udo being seedling udo and Moyashi udo simply forcing udo. Much the same distinction exists between sea kale from seed and sea kale "crowns."

Since this first introduction, the writer's attention was called by Prof. Y. Kezai, director of the Imperial Agricultural Experiment Station, Nishigahara, Tokyo, Japan, to the fact that in Japan what are really believed to be distinct strains do exist, and these have been given distinctive names. Through the kindness of Prof. Kozai these varieties were introduced and are now growing in America. They are S.P.I. Nos. 33250, "Yozaemon, red, early"; 33251, "Hanza, late"; 33252, "Fushiaka, node red, midseason"; 33253, "Shiro, white, very early"; 33254, "Nakate, Usu-Aka, rosy, midseason"; and 33255, "Kan udo, red, extra early." The writer has grown these and forced them once only, and they appear to be very similar in appearance, but whereas seedling or Kan udo in this latitude is ready to cut in April, the Hanza and Fushiaka varieties are at least three weeks or a month later. The Yozaemon has produced its shoots at almost the same time as the Kan udo. The two later starting strains will prolong the cutting season well into the middle of May in the latitude of Washington, D. C., which will be a great advantage, and it is probable that other characteristics will be discovered as experimenters become familiar with these strains.

**METHOD OF CULTURE.**

Much remains to be done in the working out of the most inexpensive methods of cultivating udo. Conditions of labor and materials are so different here from those in Japan that the methods of the Japanese have to be adapted to our own circumstances. The climate in America, at least in the Eastern States, is so different from that of Japan that methods of forcing used there are not applicable here.

As a home garden vegetable the experience of the past 10 years indicates that the udo, when once started, is a very easy plant to grow. Amateurs have experienced some difficulty in growing udo from seed, but anyone with greenhouse or cold-frame facilities should have no difficulty with fresh seed if it is sown one-fourth inch deep



FIG. 7.—Young udo plants as distributed to experimenters. Seedlings from seed planted in February should attain this size by the first of June.

in March or April in what is known as screened potting soil, consisting of 1 part loam, 1 part leaf soil or mold, and 1 part sand. In two or three weeks the seeds should be up. From the flats, the young seedlings can be planted out in the ground as soon as they are 3 or 4 inches high, or they can be potted off and later set out in the field (fig. 7). Seedlings started in boxes or flats in March will often grow 4 or even 6 feet tall the first year and will flower freely if not prevented from doing so, as they should be, by cutting or pinching out the round flower buds in midsummer. Where the question is not one of propagating a horticultural strain, the seedling method of propagation is undoubtedly the best.

Where, however, it is desired to perpetuate a particular strain, udo plants may be grown from cuttings of the green shoots. To do

this, terminal shoots should be taken when they are three-eighths of an inch in diameter and cut 5 inches or more long, care being taken to make the cut just below one of the joints, or nodes, in order to insure that the cuttings form a proper callus. In California, the head gardener of the State University, Mr. Mansell, got 80 per cent of his cuttings so made to grow satisfactorily. He took them in late summer or early fall and put them in clean sand. The writer has rooted cuttings of this kind in garden soil in Maryland.

While it is possible that cuttings of the root might grow, the writer's experiments with them have been failures, at least unless a bud from the base of the stem was included in the cutting, in which case it grew satisfactorily.



FIG. 8.—General view of one-half acre plantation of udo at the Yarrow Field Station, near Rockville, Md. The plants set from thumb pots in the spring here averaged from  $2\frac{1}{2}$  to 4 feet high in late summer.

The udo is a coarse feeder, with great succulent roots which travel rapidly through loose, rich soil. They can consume astonishing amounts of nitrogenous manures and turn them into succulent shoots. Planting udo on poor, dry lands is not recommended, for, though it would probably live, it would make no growth there. A specially constructed bed, such as is often made for asparagus, is, however, not necessary.

Three and a half feet apart is close enough for plants of the udo to stand, for as they grow older the crowns become at least a foot across. On very rich soil the writer has found 4 feet not too great a distance. When grown even with this space between them the plants will touch each other and make horse cultivation impossible late in the summer. (Fig. 8.)

Seedling plants have often produced by the following spring roots large enough to give a small crop of shoots, but it is advisable to delay cutting the crop until the second year in order not to weaken the plants at first—following in this practice that usual with asparagus.

#### THE BLANCHING OF THE SHOOTS.

The stems of the udo when green are rank in flavor, and although the green shoots when pulled, peeled, and stewed are said to make excellent greens, it is the blanched shoots first produced in the spring that form the table delicacy. The blanching of these shoots has been done in a variety of ways. At first the method followed was that of mounding up the earth over each plant in early spring, but in this climate it was found that the late frosts make the soil too cold, and



FIG. 9.—Udo planting at Baddeck, Nova Scotia, showing on the right two mounds of earth which cover plants which were cut down in midsummer. The shoots blanched under these mounds were of excellent quality. While successful in the cool summer of Nova Scotia, this method will probably not be practicable in warmer climates.

the shoots are slow in coming through it. (Fig. 9.) In California, however, on the asparagus lands near Antioch, on the Sacramento River, Mr. W. H. Meek has produced excellent udo by mounding up the hills, much as he does those of asparagus; but there the soil is almost as light as sawdust.

A very satisfactory method for blanching udo in a small home garden is to put over each hill before growth starts in the spring a large drain tile which has one end plugged with a cement cap or covering. The shoots coming up inside of the tile are well blanched, and this method has the advantage of making it possible to examine the shoots at any time to see how they are coming along. It has at least one disadvantage, however, in that the shoots have a tendency to leaf out and produce a number of unopened leafstalks which take

away from the robust growth of the shoots. A method which has obviated this defect in using tiles is to put around each hill a deep box or small half cask from which the bottom has been removed and fill it with light sand or such a light material as sifted coal ashes. Shoots which come up through such a medium are almost free from the elongated leafstalks which are developed when the shoots are produced in the dark air chambers under the tiles.<sup>1</sup> Care must be taken in any method of mounding up or filling in dirt or ashes over the crowns that the shoots do not break through into the sunlight,



FIG. 10.—The blanched shoots from a single crown of udo from which the draintile has just been removed. Note the slender leafstalks rising from the main stems. This forms an objection to the use of the draintile or any method of forcing in a closed air chamber.

for as soon as they do this they become green and take on a rank, objectionable flavor.

Properly grown udo shoots produced from 3-year-old plants should be from 12 to 18 inches long and 1 inch to  $1\frac{1}{2}$  inches in diameter at their bases (fig. 10). Such shoots are tender throughout, with no trace of fiber except in the rather thick "bark," which can be easily removed. Naturally, if one is impatient for the very first udo shoots,

<sup>1</sup> Thinking to overcome this difficulty, the experiment was made of filling the tiles with soil before inverting them over the crowns, but the plants refused to grow up through this soil.

he can cut them when only 6 inches long, but if he will wait he will be rewarded by getting shoots of somewhat astonishing proportions.

In point of season the udo crop in the latitude of Washington approaches that of asparagus. It is perhaps a few days earlier under the draintiles. If 6-inch instead of 18-inch shoots are satisfactory, a crop of udo can be taken ten days or two weeks earlier than asparagus.

Just as with asparagus, sea kale, and endive, udo can be forced by packing the roots together in a trench over a layer of heating manure, but this method makes a very expensive vegetable of it and would be resorted to only by the gardeners on large estates. Shoots can be produced in this way in March, and doubtless also in November or December. After the removal of the crop of udo shoots in the spring, the crowns of the plants should be completely uncovered and the plants allowed to grow normally throughout the summer, but they should not be permitted to flower unless seed is required, the flower clusters being pinched or cut back as they form. This latter is not a necessary precaution, but it tends to throw the growth of the plants into the roots and increase the size of the shoots for the table the following year.

#### PREPARATION FOR THE TABLE.

The flavor of udo is distinctly aromatic, like celery or parsnip, but different from either. When properly prepared it is one of the most delicious of vegetables, but unless properly cooked it is sure to meet with ridicule. The reason for this lies in the fact that its stems contain a resinous substance which gives them a decided flavor of pine when tasted raw. There are many people who never get farther than this first taste and condemn udo on the spot, forgetting how disagreeably raw vegetables often taste.

It is a simple culinary practice to boil strong-flavored vegetables in two (or even three) waters, and this is advisable as a general recommendation, although when used for soup it does not appear to be always necessary. An hour's stay in ice water will remove this resin from the shoots, provided they are cut into thin slices or shavings.

Little is known regarding the food value of udo further than that analyses show it to have about the same dietetic value as celery or asparagus. The Chinese, who are prone to ascribe mysterious properties to many of their foods, have given to udo, which they call Dotooki, Dokii quatz, or Dosjen, medicinal properties which are more curious than probable.

## RECIPES.

The following recipes for preparing udo are recommended:

*Udo on toast*.—Peel the shoots and drop them into cold water. Cut them into 4-inch lengths. Boil them in salt water for 10 minutes, then change the water, adding a fresh quantity of salted water and boiling until quite soft.

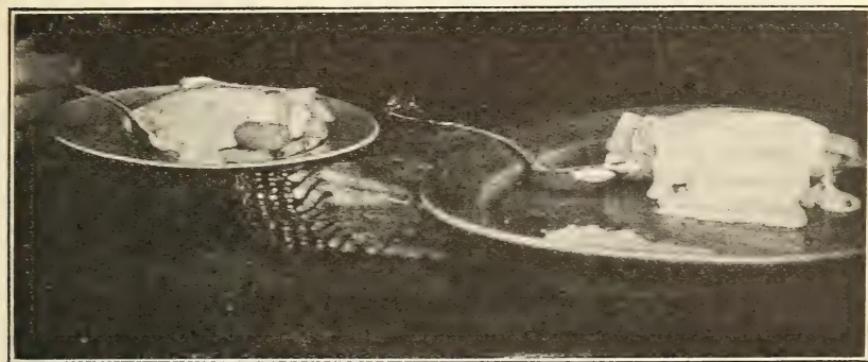


FIG. 11.—Udo on toast with cream sauce. The entire shoot can be eaten.

Prepare a white sauce, such as is used for cauliflower or asparagus, put the udo in it, and allow it to simmer until thoroughly soft. Serve on toast (fig. 11) in the usual way. If there is too much of the pine flavor, as there may be if the shoots are not thoroughly blanched, a second change of water will remedy this.

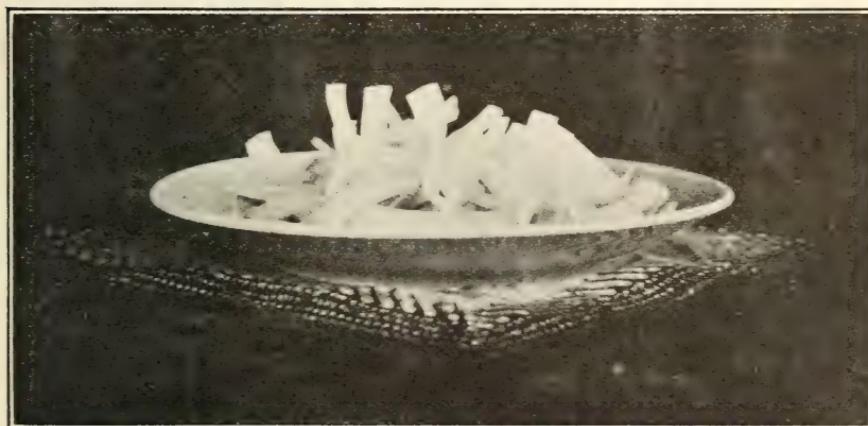


FIG. 12.—Udo as a salad. The shoots have been peeled and cut into thin shavings and left in ice water until the strong flavor has been removed, then dressed with a French dressing.

*Udo salad*.—Peel the shoots, cut them into 3-inch lengths, and then split them into thin shavings, letting these fall into ice water as they are made. Allow them to soak in the water for a half hour or an hour, so as to remove the resinous material in them. Serve with a French dressing of pepper, salt, oil, and vinegar. Do not dress the shavings until just before serving, as they become stringy on standing in oil. (Fig. 12.)

*Udo soup*.—Remove the skin from the shoots. Cut in pieces one-half inch long and wash thoroughly in cold water. Cook until tender and mash through a colander. Add a pint and a half of milk, one-half pint of cream, two tablespoonfuls of butter, and one tablespoonful of flour, mixing the flour and butter until smooth. Season with pepper and salt. (Recipe for one bunch of udo; enough for five persons.)

### CLIMATIC REQUIREMENTS OF UDO.

From the fact that udo is grown all over Japan, one might assume that it is adapted to a wide range of climate, but it must be borne in mind that Japan has an insular climate and that none of its plants are subjected to drought. The udo has done best in the moist regions of this country, especially in the New England States, Canada, and the Atlantic States as far south as the Carolinas, in the rainy region of Puget Sound, and in the trucking sections of California about Sacramento. The fact that it dies down in the winter and can be covered makes it possible to grow it where temperatures go far below zero. A temperature of  $-17^{\circ}$  F. for a few days has not injured it in the least.

### DISEASES OF UDO.

Like almost every other plant, udo has its diseases. Dr. B. D. Halsted, of New Brunswick, N. J., has had trouble with his plants because a leaf spot (*Colletotrichum*) attacked the foliage and did much damage. The writer discovered a soft rot of the roots which killed a number of apparently vigorous plants on the farm of the Department of Agriculture at Arlington, Va., the cause of which proved to be a *sclerotium*-producing fungus, the mature form of which has not yet been observed. These diseases, however serious they may seem, should not discourage the trial by thousands of Americans of this easily grown early-spring vegetable, which will thrive under so many and varied conditions.

### REASONS FOR THE INTRODUCTION OF UDO.

The writer is not certain that from a purely money-making standpoint udo will prove superior in any detail or combination of details to vegetables which are already under cultivation in America, but it has a distinctive flavor, and many people are beginning to like it, as they have learned to like celery, asparagus and eggplant. Notwithstanding its centuries of culture in the Orient, it is still a vegetable whose potentiality remains quite undetermined. It is highly desirable that many amateurs should experiment with it and the public get acquainted with it in order that a sufficient demand may be created to encourage growers to investigate it on a sufficiently extensive scale to determine whether it has any really economic advantages.

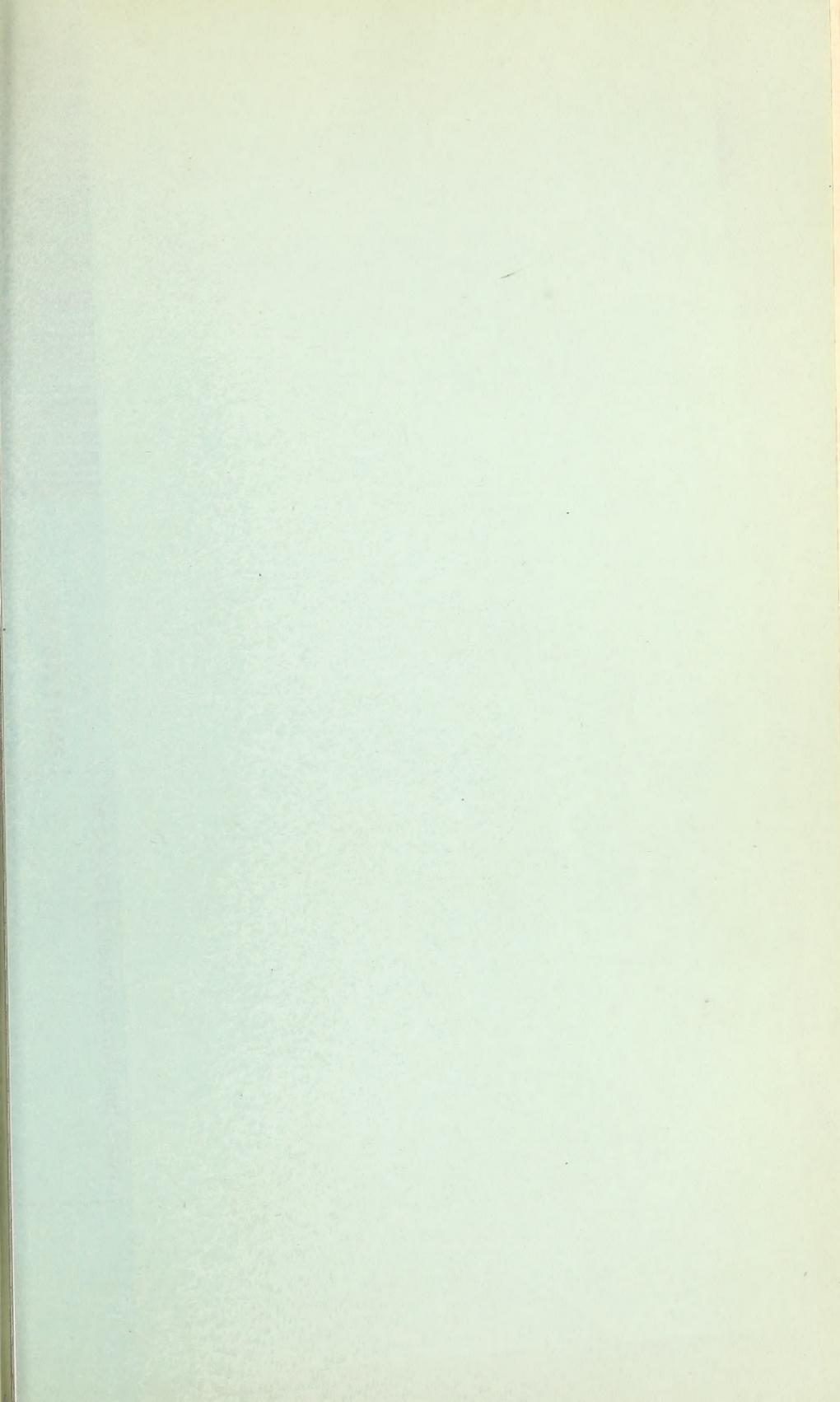
over such annual crops as celery or such perennial crops as asparagus. It has been estimated that when grown on a large scale it would require much less labor than celery and that it furnishes a crop from seed at least a year sooner than asparagus, and there may be other advantages which will appear during the long process of adaptation through which every new plant introduction must pass before it becomes a real factor in the diversification of our agriculture.

Udo has already won many adherents among those who care for new vegetables, and, although it can not by any means be said to be a well-known table vegetable, it has arrived at a point where it might be pushed by any careful, enterprising advertiser of fancy vegetables. It has been served successfully at large dinner parties in Washington and on the private tables of those who have their own gardens. It is winning its way steadily, as evidenced by the increased call for plants and the fact that importations of seed from Japan have become considerable, according to recent advices from an important nursery firm there.

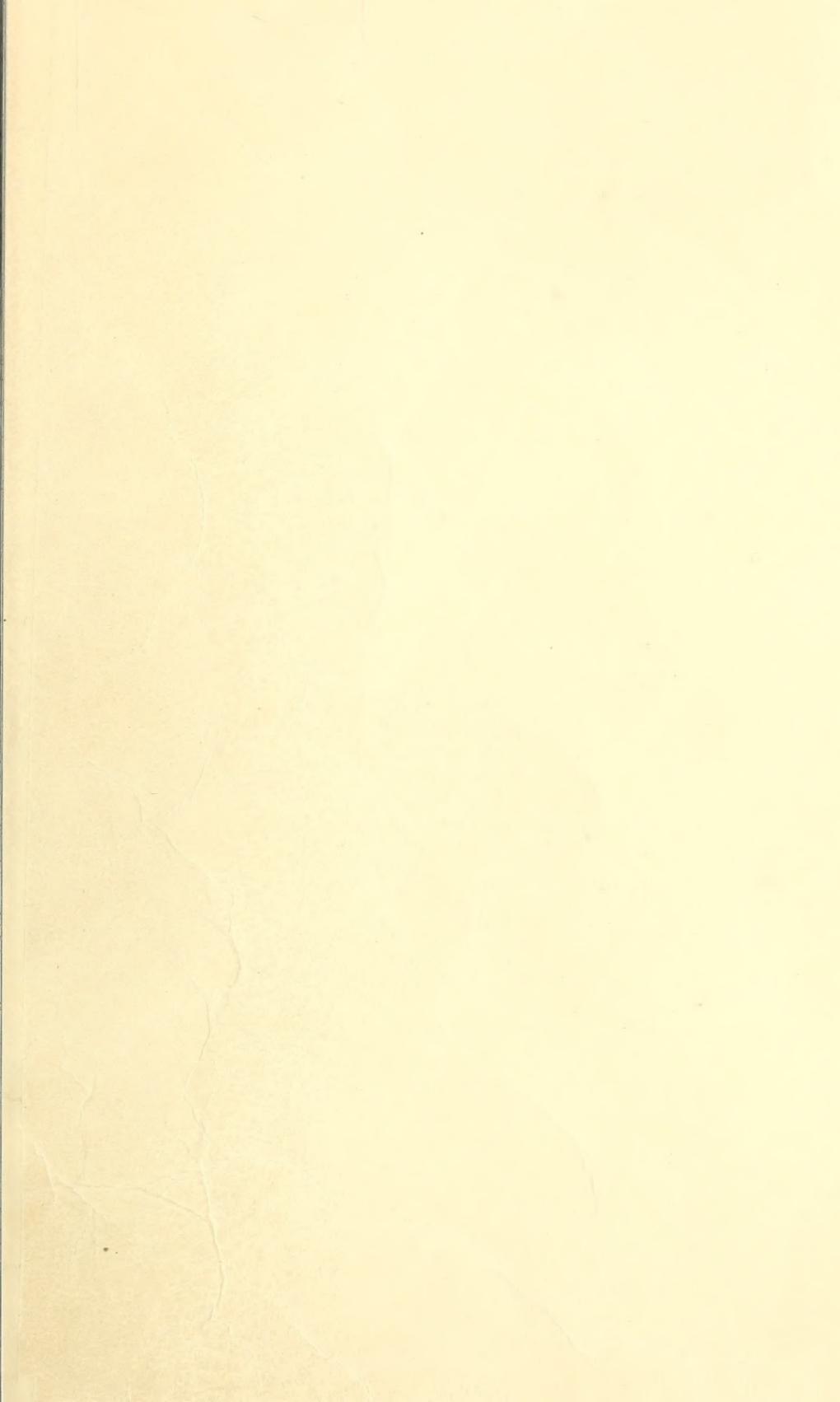
In Europe, so far as the writer is aware, udo has not made any headway; but this is not to be wondered at when we consider the conservatism it must meet there. Mr. Philippe de Vilmorin, of the firm of Vilmorin-Andrieux & Cie., of Paris, admits, however, that udo is the one Japanese vegetable which deserves to be introduced into cultivation in France.











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